

VARICOSE VEIN/VENOUS INSUFFICIENCY

Three main classification of varicose veins:

- 1) trunk or varicose veins of the greater and lesser saphenous system and its tributaries,
- 2) reticular veins-subcutaneous veins that begin at the tributary of the trunk veins.
- 3) telangiectasias, aka spider veins that are small and rarely symptomatic.

Varicose veins, most common venous complaint refer to any dilated, tortuous, elongated veins, regardless of their size.

The great saphenous vein lies in a subcompartment bordered superficially by the saphenous fascia and deeply by the muscular fascia. The saphenous fascia covers the saphenous subcompartment and separates the GSV from other veins in the superficial compartment. The saphenofemoral junction is formed by the GSV, the superficial circumflex iliac, superficial Epigastric and the external pudendal veins, aka confluence of superficial inguinal veins.

The superficial and deep venous systems of the lower extremity are separated by the deep fascia (an echogenic horizontal line) and joined by perforating veins with valves that direct unidirectional blood flow from the superficial to the deep venous system. There are approximately 90 to 150 perforators per lower extremity and most are found below the knee.

Communicating veins: veins that connect superficial vein to superficial vein

Perforator veins: connect superficial veins to deep veins

The direct perforators communicate between the superficial and deep veins and the indirect perforators interrupt their course in muscular veins before terminating in the deep veins.

Typically, the diameter of a normal, competent communicating vein is <2mm, therefore, many of them are not routinely recognized during routine duplex imaging of the leg. However, with the highly sensitive Doppler imaging methods now in use, even normal perforators can frequently be seen.

Several observations on the size, appearance, and expected flow direction within perforator veins (PV) can help the vascular sonographer sort things out.

Proper Nomenclature

Older Term

Lesser Saphenous Vein(LSV)

Giacomini Vein

SFJ or Crosse

Dodd or Hunter Perforators

Sherman and Boyd Perforators

Posterior Arch Vein

Cockett Perforators

Communicating veins

Also known as

Small Saphenous Vein (SSV)

Cranial Extension of the SSV

Confluence of the superficial inguinal veins

Femoral Canal Perforators

Paratibial Perforators

Posterior Accessory GSV

Posterior Tibial Perforators

intersaphenous veins

Nomenclature of the veins of the lower limbs: An international interdisciplinary consensus statement, Alberto Caggiati,MD, John Bergan,MD, Peter Gloviczki,MD, Georges Janet,MD, Colin P. Wendell-Smith MD, and Hugo Partsch, MD

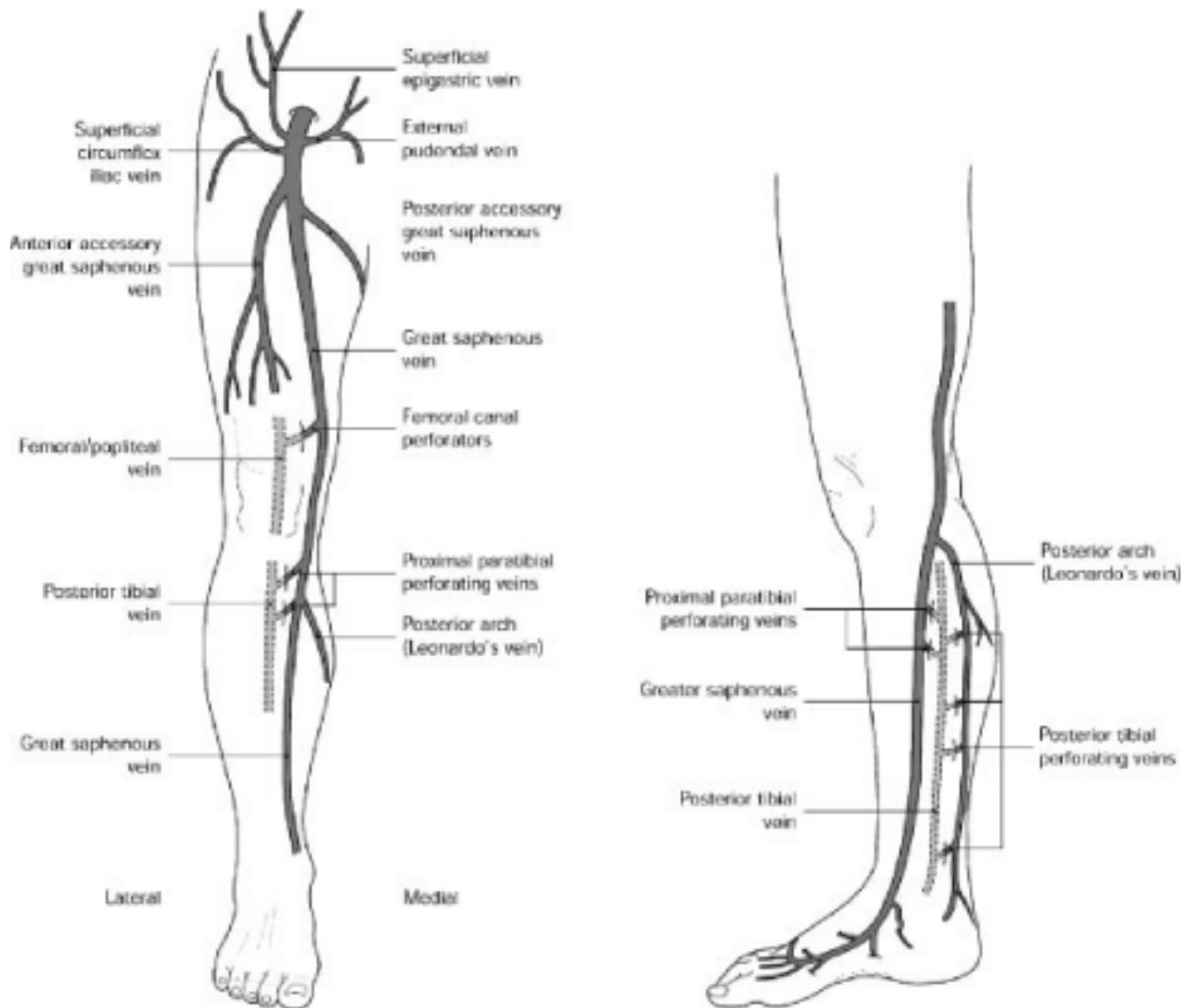
The calf contains four groups of perforators:

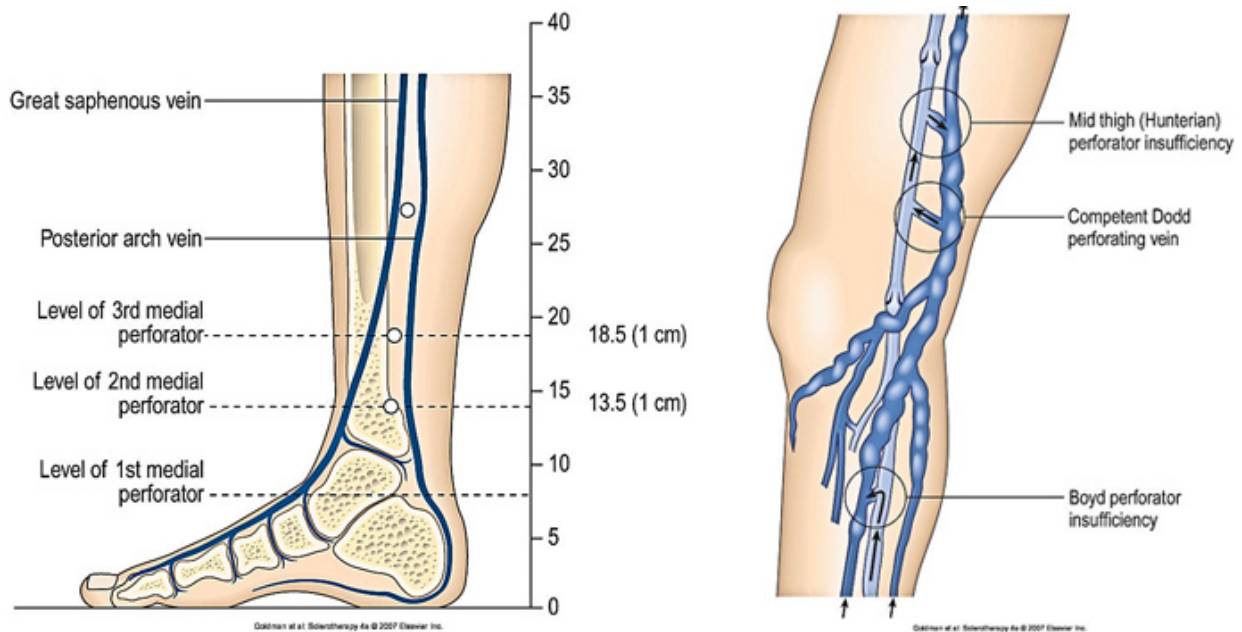
- Medial calf perforators connect posterior accessory greater saphenous (posterior arch vein, aka Leonardo's vein) or GSV with the posterior tibial veins. These are located in the distal half of the medial side of the calf. These are clinically most important & include:
 - 1) Paratibial perforators-direct perforating veins-(aka Boyds perforator)—connect the GSV to the PTV & muscular veins
Locations:
 - a) 1 cm from tibia and 18-22 cm from the medial malleolus in proximal part of medial leg
 - b) 23-27 cm from medial malleolus
 - c) 28-32 cm from medial malleolus
 - 2) Posterior tibial perforators (aka Cockett perforators) connect the posterior accessory GSV vein to PTVs
Locations (classified as upper, mid & lower):
 - a) Behind the medial ankle.
 - b) 7-9 cm from tip of medial malleolus
 - c) 10-12 cm from tip of medial malleolus
 - d) 2-4 cm of the medial edge of the tibia.
- Other noted calf perforators:
 - 3) Lateral calf perforators (aka Bassi's perforator) are peroneal perforators which connect the lesser saphenous with the peroneal veins. Indirect perforators off the LSV may connect with the gastrocnemius or soleal veins.
Locations:
 - a) 5-7 cm from lateral ankle
 - b) 12-14 cm from lateral ankle
 - 4) Anterior calf perforators connect the anterior tributaries of the GSV to ATVs.
Locations:
 - a) 2-5 cm from lateral edge of tibia.

In the thigh, Dodd's and Hunterian perforators, Both connect the saphenous vein with the popliteal or femoral veins.

Approximately 60% of small saphenous veins join the popliteal vein within 8 cm of the knee joint, 20% join the great saphenous vein via anterior or posterior tributaries, and 20% join the femoral, deep femoral, or internal iliac veins

The saphenous vein and associated arteries and nerves lie within the saphenous compartment, and the reticular veins, accessory veins, and tributary veins are external to the compartment. True duplication of the great saphenous vein, identified by splitting of the vein into two channels, both lying on the muscular fascia and which later rejoin, is present in the thigh in 8% and in the calf in 25% of cases. The great saphenous vein may penetrate the saphenous fascia at the level of the middle or distal thigh and become more superficial





References:

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